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author attacks the argument for vaccination founded on the diminution in the amount of small-pox during this century by pointing out that typhus fever without the help of vaccination has also been much reduced in prevalence in the same time, and that both diseases are less frequent on account of better sanitary conditions. The comparison of typhus fever to small-pox, however, is deceptive first because as the clinical separation of typhus from typhoid fever became general only about the middle of this century, the reduction in typhus cannot be properly estimated, and second, because the improvement in sanitation does not apply equally to both. Crowding in filthy and unventilated rooms is necessary for the development of 'camp,' 'jail' or 'ship' fever, but small-pox for centuries went into the palace as well as into the hovel. The circle of infection of typhus fever is small, that of small-pox is large. Dr. Tebb's mode of reasoning is capitally illustrated by the following: "I have shown that a part of the decline of small-pox and especially that part which has taken place in children is not necessarily a saving of life, but only a shifting of the mortality on to some other disease such as measles or whooping cough." According to this reasoning, as the children probably have to die any how from some disease, they may as well die from small-pox.

The author devotes a chapter to the discussion of epidemics in various English towns, and points out that the epidemics occur in well vaccinated just as in poorly vaccinated places, and that they can be controlled without recourse to vaccination. To obtain all the facts about all the places mentioned would be a long task, but the vital facts about two of his examples, Leicester and Sheffield are well known. In unvaccinated Leicester, during the epidemic of 1892-1893, there were 21 deaths, 19 in unvaccinated and 2 in vaccinated persons over ten years old. In well vaccinated Sheffield in the epidemic of 1887-1888, there were 68,000 vaccinated children of whom  $\frac{1}{2}$  per cent. were attacked and 2,200 unvaccinated children of whom 10 per cent. were attacked; there were also about 200,000 vaccinated persons over ten years of age of whom 2 per cent. were attacked and about 3,500 unvaccinated persons of whom 9

per cent. were attacked. The above well illustrates the established fact that vaccination protects somewhat for years, but only absolutely for from 6 to 8 months.

A long chapter which embodies the second argument is that devoted to vaccinal injuries. To clear the way for criticism of this it may be said that there is no dispute that injuries sometimes follow vaccination, that skin eruptions are moderately frequent, and that all varieties of sepsis are possible when the wound is made or cared for in an unclean way or when infected virus is inserted. Thirty pages are, however, given up to proved and unproved cases of so-called vaccino-syphilis. The truth with regard to this infection is that invaccination of syphilis is possible when vaccination is done from arm to arm, probably impossible and certainly unknown when done with calf virus. Moreover in the  $5\frac{1}{4}$  million primary vaccinations done during the session of the Royal Commission in England, 1889-96, there was not a single case proved, and every alleged case was investigated. Twenty-one pages give some account of the contradictory evidence relating to the invaccination of leprosy. If this invaccination is possible when done from arm to arm, an assumption which has not been proved, yet it has at present no public importance in England or the United States. Tuberculosis and tetanus consume eight pages, yet there is no case on record in which tuberculosis was ever conveyed by vaccination, and although there have been several cases where tetanus has been alleged to have followed vaccination, yet even granting that this is so, it simply enforces the rule that vaccination should be only performed in a cleanly way.

The third argument of Dr. Tebb against compulsion may, now that compulsion no longer exists, be left as the expression of his individual opinion.

For information relative to some of the above questions, the writer wishes to thank Dr. J. H. Huddleston, who has charge of the vaccine laboratory of the New York City Health Department.

W. H. PARK.

NEW YORK.

#### GENERAL.

THE U. S. National Museum has just published a careful translation, by Mr. E. O.

Hovey, of Dr. Salvatore Lo Bianco's detailed account of the methods employed at the Naples aquarium for preserving invertebrates. The many who have admired the beautiful specimens sent out from that institution will be glad to have this paper, although it is evident that the factor of patience must enter largely into most of the processes described. The article is prefaced by a brief account of the aquarium and its work.

THE publication is announced by Archibald Constable & Co., of a *Physical Atlas*, prepared under the direction of Mr. J. G. Bartholomew, of the Edinburgh Geographical Institute. The work will be in seven volumes as follows : I. Geology ; II. Orography, Hydrography and Oceanography ; III. Meteorology ; IV. Botany ; V. Zoology ; VI. Ethnography and Demography ; VII. General Cosmography and Terrestrial Magnetism. The atlas of Berghaus will to a certain extent be used, but the plates will be larger in size and special attention will be paid to phenomena of interest to English and American students. The volume on meteorology is promised for the present year and the others are expected to follow in rapid succession.

#### BOOKS RECEIVED.

*Statistics and Economics.* RICHMOND MAYO-SMITH. New York and London, The Macmillan Company. 1899. Pp. xiii+467. \$3.00.

*The Principles of Differential Diagnosis.* FRED. J. SMITH. New York and London, The Macmillan Company. 1899. Pp. ix+353. \$2.00.

*Résistance électrique et fluidité.* GOURÉ DE VILLE-MONTÉE. Paris, Gauthier-Villars. 1899. Pp. 188. 3 fr.

*Essais des huiles essentielles.* HENRI LABBÉ. Paris, Gauthier-Villars. 1899. Pp. 108.

*Le café culture—manipulation, production.* HENRI LECOMTE. Paris, Georges Carré and C. Naud. 1899. Pp. vi+334. 5 fr.

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#### SCIENTIFIC JOURNALS AND ARTICLES.

THE *National Geographic Magazine* for October opens with an illustrated article on 'Life on a Yukon Trail,' by Professor Arthur P. Dennis, of Northampton, Mass. Mr. Gifford Pinchot, the Forester of the U. S. Department of Agriculture, in an illustrated paper, 'The Relation of Forests and Forest Fires,' describes

the effect of forest fires as modifiers of the composition and mode of life of the forest. A. J. Henry, Chief of the Division of Records, U. S. Weather Bureau, contributes a study of the fluctuations in the surface level of the Great Lakes, especially interesting at the present time owing to the near completion of the Chicago drainage canal. The contents of the number also include 'Tides of Chesapeake Bay,' by E. D. Preston ; 'Calculations of Population in June, 1900,' by Henry Farquhar, a paper read before Section I. of the American Association for the Advancement of Science, Columbus, August 22d ; 'Peary's Work and Prospects,' by H. L. Bridgeman, Secretary of the Peary Arctic Club. There are a number of briefer articles, 'Peary's Explorations in 1898-1899,' 'The Definite Location of Bouvet Island,' and 'The California and Nevada Boundary.'

*Bird Lore* for October has for its opening article an account of the origin and work of 'The American Ornithologists' Union,' by J. A. Allen, accompanied by a plate showing the founders of the society, comprising some of the men whose names are familiar to every student of American ornithology. 'American Bitterns' consists of two plates of the young, one and two weeks old, from photographs by E. H. Tabor and F. W. Chapman. Henry Van Dyke contributes a poem 'The Angler's Reveille,' Robert W. Hagner an article on 'The Prairie Horned Lark,' and C. F. Hodge notes 'A Pleasant Acquaintance with a Hummingbird.' H. M. Collins describes 'A Peculiarity of a Caged Skylark,' and Anna Harris Smith and C. F. Hodge describe 'The Ethics of Caging Birds.' Isabella McC. Lemmon writes of 'Oliver Twist, Catbird,' for young observers, and there are numerous notes and book reviews. Under the section devoted to Audubon Societies the wearing of quill feathers of the eagle and pelican is justly deprecated, and fac-simile and sketch of Audubon's seal, the wild turkey, is given.

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#### DISCUSSION AND CORRESPONDENCE.

THE PROPOSED CARD CENTRALBLATT OF PHYSIOLOGY.

TO THE EDITOR OF SCIENCE: The volume of scientific literature is increasing at a rate that